

CLAIMS

1. A process simulation system for executing a process simulation of a production system, comprising:

an element arrangement data reading means for sequentially reading component element names which are combined with process identification names from an element arrangement data, the element arrangement data describing an arrangement of various component elements constituting the production system with combinations of the process identification names and the component element names along a work flow;

an element definition file reading means for sequentially reading element definition files corresponding to component element names which had been read in by the element arrangement data reading means from a plurality of element definition files, the element definition files describing simulation programs for executing operational simulations of the various component elements for each of the component elements;

a program array preparing means for preparing a simulation program array by sequentially arranging simulation programs respectively described in element definition files which had been read in by the element definition file reading means; and

a program execution means for simulating operations of the various component elements constituting the production system by executing a series of simulation programs included in the simulation program array prepared by the program array preparing means.

2. A process simulation system according to claim 1, wherein the element arrangement data comprise tabular form data prepared using a software capable of editing to, for example, add and delete textual information, the work flow being set in a row direction, and the process identification names and the component element names being described in a line direction.

3. A process simulation system according to claim 2, wherein

each of the element definition files contains a program description describing an own simulation program and a variable description describing a variable used in the own simulation program, in the variable description, an external reference variable to designate a referring variable being defined in a case of an element definition file to refer to a variable in an other element definition file, and a take-out variable referred to by an external reference variable being defined in a case of an element definition file to make an other element definition file refer to a variable,

the process simulation system further comprising:

a variable array preparation means for preparing a variable array including all variables described in the variable description of each of the element definition files which had been read by the element definition file reading means; and

a variable corresponding means for making the external reference variable contained in the variable array prepared by the variable array preparation means correspond to the take-out variable.

4. A process simulation system according to claim 3, wherein:

a variable name replacing data for replacing a variable name described in the variable description of each of the element definition files to a different variable name is described in the element arrangement data,

the process simulation system further comprising a variable name replacing means for replacing a variable name for which the variable name replacing data is set in the element arrangement data to an other variable name described in the variable name replacing data.

5. A process simulation system according to claim 3 or 4, wherein:

in the variable array prepared by the variable array preparation means, a variable table provided with a required number of registration areas for collectively controlling same kinds of variables ranging among a plurality of component elements,

in element definition files containing the same kinds of variables that are controlled collectively out of the element definition files, initial processing programs to register positions of the variables in the variable array are described in corresponding variable tables in the variable array prepared in accordance with the variables,

the program array preparation means prepares an initial process program array by sequentially arranging the initial process programs respectively described in the element definition files which had been read by the element definition file reading means, and

the program execution means executes initial process programs contained in the initial process program array prepared by the program array preparation means and registers positions of the variables in the variable array on the variable table in the variable array for the same kind of variables to be collectively controlled.

6. A process simulation system according to any one of claims 1 to 5, wherein a simulation program described in the program description of each of the element definition files is described in a ladder language type command group.

7. A computer readable recording medium in which a program for a process simulation system to function a computer as the process simulation system as defined in any one of claims 1 to 6 is recorded.